STANDING STOCK DENSITY ESTIMATES (Kg/hectare) FOR FISH FROM 1969 THRU 70 UNDP/FAO AND 1976 EAFFRO TRAWL SURVEYS IN THE KENYA WATERS OF LAKE VICTORIA

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ABSTRACT

A statistical comparison of standing stock density estimates (Kg/hectare) from 26 UNDP/FAO 1969 thru 70 and 63 EAFFRO 1976 bottom trawl surveys revealed the following:

1) Statistically significant differences between mean density values at 4 of 7 depths (4-9 to 30-39 m).
2) The 1969 thru 70 UNDP/FAO values were higher at the 4 levels.
3) No statistically significant mean density value differences at 3 depths (40-49 to 60-69 m), but decreased values for the 1976 EAFFRO survey at 40-49 and 50-59 m depth.

It was concluded from these comparisons that no capital investment should be made into a trawler industry for fish meal production in the Kenya waters of Lake Victoria until further bottom trawl surveys can be conducted to either substantiate or disapprove these differences over the six year time span.

INTRODUCTION

Standing stock density estimates (Kg/hectare) were calculated for 26 UNDP/FAO bottom trawls made in 1969 thru 70 and 63 EAFFRO bottom trawls made in 4th quarter 1976. All trawls were made using 40 mm codend mesh in seven depth zones in the Kenya waters of Lake Victoria. These densities were then compared to determine trends and any statistically significant differences occurring over the six year time span.

METHODS

The following formula was utilized to calculate density:

$$\text{Area (hectare) of one hour haul} = \frac{(\text{headrope length m}) \; 0.1852 \times \text{towing speed in knots}}{1.5}$$

This formula makes the trawl hauls of the IBIS (UNDP/FAO) and CORMORANT (EAFFRO) comparable although each used different size trawls, trawling speed and trawl duration (1 hour for IBIS and 0.5 hour for CORMORANT).

CONCLUSIONS AND DISCUSSION

Table 1 shows the comparison of standing stock density estimates for total density, Haplochromis spp. density and other species density for both surveys. In six of the seven depths the mean density is higher for total density, Haplochromis spp. density, and other species density in the 1969 thru 70 UNDP/FAO survey than the 1976 EAFFRO survey. There were significant statistical differences between mean density values for total density and Haplochromis spp. density at 4 of the 7 depths (4-9 to 30-39), but no significant statistical differences at the three deeper areas (40-49 to 60-69). This indicates a statistically significant decrease in fish density (Kg/hectare) in the 4-9 to 30-39 m depths in the Kenya waters of Lake Victoria. Although no statistically significant difference occurs at the 40-49 or 50-59 m depth, the UNDP/FAO densities were higher for both total density, Haplochromis spp. density and

other species density. Only at the 60-69 m depth did the EAFFRO survey have higher densities, but none were statistically significant and the densities were based on a total of 3 trawls.

Based upon the statistically significant decreases in fish density and the low mean values per depth collected with a 40 mm codend mesh it would seem adviseable not to invest capital into a trawler industry and fishmeal plant for Kenya waters until further trawl surveys can be conducted to either substantiate or disapprove the above mentioned density values.

Table 1. Comparison of standing stock densities (kg)/Hectare from 1969-70 UNDP/FAO and 1976 EAFFRO bottom trawl surveys in the Kenya waters of Lake Victoria.

Depth (m)	Number of Trawls	Total Density	Ter Z calculated	Haplochromis Density	Ter Z calculated	Percent Total	Others Density	Percent Total	Survey *
4-9	6	35.1	7.86**	18.6	5.75**	53.0	16.5	47.0	1
	17	7.2		4.0		55.6	3.2	44.4	2
10-19	5	50.7	4.02**	31.9	2.76**	62.9	18.8	37.1	1
	18	20.5		10.4		50.7	10.1	49.3	2
20-29	1	68.4	4.59**	52.8	5.43**	77.2	15.6	22.8	1
	10	21.3		13.8		64.8	7.5	35.2	2
30-39	1	148.0	5.19**	130.0	5.28**	87.8	18.0	12.2	1
	5	24.3		19.0		78.2	5.3	21.8	2
40-49	5	79.8	0.82	70.5	0.77	88.3	9.3	11.7	1
	6	56.9		49.7		87.3	7.2	12.7	2
50-59	7	30.3	0.37	27.0	0.48	89.1	3.3	10.9	1
	5	25.1		20.6		82.1	4.5	17.9	2
60-69	1	1.8	0.83	0.7	0.59	38.9	1.1	61.1	1
	2	4.7		2.5		53.2	2.2	46.8	2

* 1 UNDP/FAO survey 1969-70
* 2 EAFFRO Survey 1976
** Statistically significant difference between means